CONAXIS - VERIFICATION

1D Terzaghi problem

A soil sample, which has the height *H*, is laterally constrained and is subjected a pressure *p* on the top (Fig. 1). At the beginning, the initial pore pressure p_0=*p*. The pore pressure at the time *t* and the position *z* is[1]:

$$p = p_0 \frac{4}{\pi} \sum_{j=1}^{\infty} \frac{-1^{j-1}}{2j-1} \cos\left[(2j-1)\frac{\pi}{2}\frac{z}{H}\right] \exp\left[-(2j-1)^2 \frac{\pi^2}{4}\frac{c_v t}{H^2}\right] \quad (1)$$

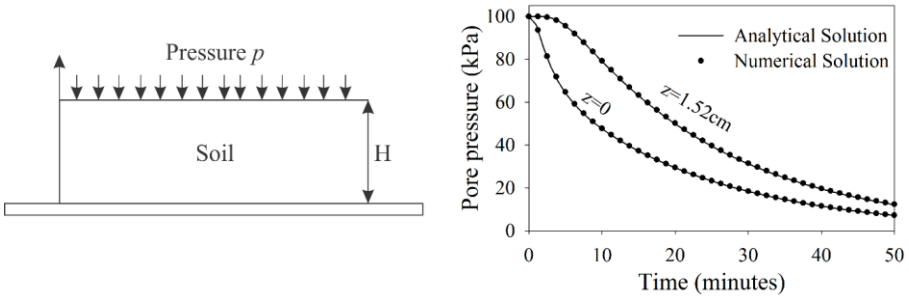

Fig. 1: Verification of 1D Terzaghi consolidation problem

The input parameters using for the verification model are: the bulk modulus *K=1000 kN/m²,* the Poisson's ratio υ *=0.2;* the hydraulic conductivity *k=1e-9 m/s;* the initial pore pressure p_0 *=100 kN/m²*; *H=2.54 cm; R=3.175 cm*; Total consolidation time *t = 50 minute*.

References

[1] Verruijt A. PoroElasticity: http://geo.verruijt.net/, 2016.